



Control Number: 49737



Item Number: 68

Addendum StartPage: 0

**SOAH DOCKET NO. 473-19-6862  
PUC DOCKET NO. 49737**

**APPLICATION OF SOUTHWESTERN § BEFORE THE STATE OFFICE  
ELECTRIC POWER COMPANY FOR §  
CERTIFICATE OF CONVENIENCE §  
AND NECESSITY AUTHORIZATION § OF  
AND RELATED RELIEF FOR THE §  
ACQUISITION OF WIND §  
GENERATION FACILITIES § ADMINISTRATIVE HEARINGS**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S SUPPLEMENTAL RESPONSE  
TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR  
INFORMATION**

**SUPPLEMENTAL RESPONSE NOS. TIEC 2-2 AND TIEC 2-7**

**AUGUST 29, 2019**

**TABLE OF CONTENTS**

<b><u>SECTION</u></b>	<b><u>FILE NAME</u></b>	<b><u>PAGE</u></b>
Supplemental Response No. TIEC 2-2	49737 TIEC02S PKG.pdf	2
Attachment to Response No. TIEC 2-2	49737 TIEC02S PKG.pdf	4
Supplemental Response No. TIEC 2-7	49737 TIEC02S PKG.pdf	7
Attachment to Response No. TIEC 2-7	49737 TIEC02S PKG.pdf	8

**Files provided electronically on the PUC Interchange**

TIEC\_2-2\_Supplemental\_Attachment\_1\_SWEPCO\_P95\_Low\_NoCO2.xlsx  
TIEC\_2\_7\_Supplemental\_Attachment\_1.xlsx

**SOAH DOCKET NO. 473-19-6862  
PUC DOCKET NO. 49737**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S SUPPLEMENTAL RESPONSE  
TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR  
INFORMATION REQUEST FOR INFORMATION**

**Question No. TIEC 2-2:**

Please provide an NPV evaluation of the guarantees case assuming Low Gas, No CO2.

**Response No. TIEC 2-2:**

The Company believes that the chance of the combination of the Low Gas, No CO2 guarantees (P95) case occurring over either the 10 year guarantee period or the 30 year analysis period is remote, which is why it wasn't prepared and included in the Company's filing. The P95 level of production assumed in this case only has a 5% chance of occurring over any 5 year block of time and an even smaller chance over six 5 year blocks of time in a row. Production is just as likely to occur at the P5 level as it is at the P95 level. The requested case would assume no CO2 legislation is enacted at any time between now and 2051, the extremely low power prices in the Low Gas, No CO2 case are sustained for the 10 year guarantee period and through 2051, and the P95 level of production occurs for expected periods of time. The average generation weighted around the clock power price in the first 5 years of this case is only \$25.25 and the first 10 years is only \$27.63. By comparison, day-ahead and real-time prices in SPP both averaged approximately \$25/MWh for the year in 2018.

Source: SPP State of the Market Report:

<https://www.spp.org/documents/59861/2018%20annual%20state%20of%20the%20market%20report.pdf>

Notwithstanding these issues, for the purpose of responding to this request, the Company is preparing an estimate of what that case would look like by using simplifying assumptions and numbers from other cases which would be the same in this case. As stated in the Company's response to TIEC 1-19, the Company is reviewing a portion of its analysis which may lead to updated/supplemental new workpapers for Company witness Torpey's economic benefit analysis. Once this review is complete this response will be supplemented with the requested information.

**Supplemental Response No. TIEC 2-2:**

The Company believes that the chance of the combination of the Low Gas, No CO2 guarantees (P95) case occurring over either the 10 year guarantee period or the 30 year analysis period is remote, which is why it wasn't prepared and included in the Company's filing. The P95 level of production assumed in this case only has a 5% chance of occurring over any 5 year block of time and an even smaller chance over six 5 year blocks of time in a row. Production is just as likely to

occur at the P5 level as it is at the P95 level. The requested case would assume no CO2 legislation is enacted at any time between now and 2051, the extremely low power prices in the Low Gas, No CO2 case are sustained for the 10 year guarantee period and through 2051, and the P95 level of production occurs for expected periods of time. The average generation weighted around the clock power price in the first 5 years of this case is only \$25.25 and the first 10 years is only \$27.63. By comparison, day-ahead and real-time prices in SPP both averaged approximately \$25/MWh for the year in 2018.

Source: SPP State of the Market Report:

<https://www.spp.org/documents/59861/2018%20annual%20state%20of%20the%20market%20report.pdf>

Notwithstanding the remote likelihood of this case occurring, in response to this request the Company prepared the requested analysis. See TIEC\_2\_2\_Supplemental\_Attachment\_1 for the requested analysis, along with the PLEXOS inputs supporting the production cost savings in this case. Capacity value, PTC, DTA carrying charges, and the wind facility revenue requirement are unchanged from the P95 cases initially presented in witness Torpey's Exhibit JFT-3.

Prepared By: Jon R. Maclean

Title: Resource Planning Mgr

Prepared By: James F. Martin

Title: Regulatory Case Mgr

Sponsored By: John F. Torpey

Title: Mng Dir Res Plnning&Op Anlysis

**NORTH CENTRAL WIND ENERGY FACILITIES - SWEP CO 810 MW SHARE OF ALL THREE PROJECTS  
P95 15% CAPACITY CREDIT LOW GAS NO CARBON CUSTOMER COSTS AND BENEFITS - No Tie Line**

\$ In Millions (Nominal unless otherwise indicated)

Year	NPV	Total 31 Yr. Nominal	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1 Production Cost Savings Excluding Congestion/Losses	\$1,111	\$3,486	\$9	\$65	\$67	\$70	\$73	\$76	\$78	\$81	\$82	\$85	\$88
2 Congestion and Losses	(\$199)	(\$535)	(\$2)	(\$14)	(\$14)	(\$15)	(\$16)	(\$16)	(\$17)	(\$18)	(\$19)	(\$19)	(\$19)
3 Capacity Value	\$29	\$83	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4 Production Tax Credits, Grossed Up	\$546	\$834	\$13	\$76	\$79	\$79	\$82	\$82	\$85	\$85	\$88	\$88	\$75
5 Deferred Tax Asset Carrying Charges	(\$96)	(\$163)	(\$0)	(\$3)	(\$8)	(\$12)	(\$14)	(\$16)	(\$17)	(\$18)	(\$19)	(\$19)	(\$18)
6 Wind Facility Revenue Requirement	(\$1,348)	(\$3,233)	(\$17)	(\$132)	(\$130)	(\$130)	(\$128)	(\$127)	(\$126)	(\$124)	(\$123)	(\$121)	(\$119)
7 Tie Line Revenue Requirement	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>8. Total Net Customer Benefits/(Cost)</b>	<b>\$43</b>	<b>\$473</b>	<b>\$3</b>	<b>(\$7)</b>	<b>(\$6)</b>	<b>(\$7)</b>	<b>(\$2)</b>	<b>(\$1)</b>	<b>\$3</b>	<b>\$6</b>	<b>\$11</b>	<b>\$15</b>	<b>\$8</b>

Year	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
1 Production Cost Savings Excluding Congestion/Losses	\$92	\$99	\$103	\$107	\$109	\$113	\$110	\$107	\$119	\$115	\$119	\$129	\$133
2 Congestion and Losses	(\$19)	(\$19)	(\$19)	(\$19)	(\$19)	(\$19)	(\$19)	(\$19)	(\$19)	(\$19)	(\$19)	(\$19)	(\$19)
3 Capacity Value	\$0	(\$7)	(\$7)	(\$7)	(\$7)	(\$6)	\$47	\$55	(\$1)	\$57	\$56	(\$3)	(\$2)
4 Production Tax Credits, Grossed Up	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5 Deferred Tax Asset Carrying Charges	(\$13)	(\$5)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6 Wind Facility Revenue Requirement	(\$116)	(\$114)	(\$112)	(\$110)	(\$108)	(\$106)	(\$104)	(\$102)	(\$100)	(\$98)	(\$97)	(\$95)	(\$93)
7 Tie Line Revenue Requirement	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>8. Total Net Customer Benefits/(Cost)</b>	<b>(\$57)</b>	<b>(\$46)</b>	<b>(\$35)</b>	<b>(\$29)</b>	<b>(\$24)</b>	<b>(\$17)</b>	<b>\$35</b>	<b>\$42</b>	<b>(\$1)</b>	<b>\$55</b>	<b>\$60</b>	<b>\$12</b>	<b>\$19</b>

Year	2045	2046	2047	2048	2049	2050	2051
1 Production Cost Savings Excluding Congestion/Losses	\$140	\$145	\$189	\$195	\$200	\$203	\$185
2 Congestion and Losses	(\$19)	(\$19)	(\$19)	(\$19)	(\$19)	(\$19)	(\$16)
3 Capacity Value	(\$2)	(\$2)	\$12		(\$35)	(\$37)	(\$37)
4 Production Tax Credits, Grossed Up	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5 Deferred Tax Asset Carrying Charges	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6 Wind Facility Revenue Requirement	(\$91)	(\$89)	(\$88)	(\$86)	(\$85)	(\$86)	(\$81)
7 Tie Line Revenue Requirement	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>8. Total Net Customer Benefits/(Cost)</b>	<b>\$29</b>	<b>\$35</b>	<b>\$95</b>	<b>\$101</b>	<b>\$61</b>	<b>\$62</b>	<b>\$52</b>

	NPV	Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Allocation of Capacity to Jurisdictions.	Modeled Allocation	Total Project Percent	SWEPCO Percent															
	Arkansas	155	10.4546%	19.1668%														
	Louisiana	268	18.0740%	33.1356%														
	Texas	309	20.7888%	38.1128%														
	FERC	78	5.2289%	9.5863%														
	Total SWEPCO	810		100.00%														
	OklaHoma	675	45.45%															
Total Project	1,485	100.00%																
NPV Discount rate	7.09%																	
Off System Sales Margin Retained by AEP - Deduct from Plexos Benefits																		
Total Plexos OSS Margin by Case																		
Margin Retention	Margin Retained																	
Arkansas	10.0%																	
Louisiana	10.0%																	
Texas	10.0%																	
FERC	10.0%																	
TIEC 2-2 SWEPCO Low No CO2 P95 Case PLEXOS Inputs																		
Net Production Cost Savings																		
Project Low Gas No Carbon	\$6,755	\$17,478	\$552.8	\$525.0	\$545.9	\$541.9	\$569.0	\$579.3	\$577.9	\$570.2	\$509.2	\$482.5	\$484.6	\$481.3	\$474.8	\$460.8	\$473.5	\$481.1
Baseline Low Gas No Carbon=P50.15% case	\$7,676	\$20,485	\$559.7	\$576.5	\$599.3	\$597.4	\$626.2	\$639.1	\$639.5	\$633.2	\$573.6	\$549.8	\$555.1	\$555.5	\$556.0	\$546.1	\$563.2	\$573.4
Savings, pre-margin sharing pre Gen Tie	(\$921)	(\$2,987)	(\$6.9)	(\$51.5)	(\$53.3)	(\$55.5)	(\$57.2)	(\$59.9)	(\$61.6)	(\$63.0)	(\$64.3)	(\$67.2)	(\$70.5)	(\$74.2)	(\$81.1)	(\$85.3)	(\$89.7)	(\$92.3)
Less: Lost energy value from losses on Gen Tie																		
Lost GWh on Gen Tie			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual Average market Price-Load Hub (\$/MWh)			23.4	23.9	24.7	25.5	26.5	27.3	28.2	29.4	29.8	40.6	41.6	42.7	43.6	45.5	46.9	47.8
Lost Energy Revenue (\$MM)			\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Savings, pre-margin sharing	(\$921)	(\$2,987)	(\$6.9)	(\$51.5)	(\$53.3)	(\$55.5)	(\$57.2)	(\$59.9)	(\$61.6)	(\$63.0)	(\$64.3)	(\$67.2)	(\$70.5)	(\$74.2)	(\$81.1)	(\$85.3)	(\$89.7)	(\$92.3)
OSS Margin Savings																		
P95 Low Gas No Carbon Fundamentals (\$ Millions)	NPV	Nominal Total 31 year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
SWEPCO Gross OSS Margin With Project	\$357	\$1,644	\$3.57	\$4.34	\$5.27	\$6.75	\$2.68	\$3.26	\$4.67	\$3.23	\$6.13	\$10.82	\$15.00	\$21.07	\$19.35	\$30.39	\$34.44	\$36.80
SWEPCO Gross OSS Margin Without Project	\$264	\$1,285	\$3.12	\$1.52	\$1.97	\$2.69	\$0.92	\$1.10	\$1.51	\$0.95	\$3.38	\$5.18	\$7.48	\$11.92	\$10.89	\$18.78	\$21.91	\$22.75
SWEPCO Gross OSS Margin Increase	\$93	\$359	\$0.5	\$2.8	\$3.3	\$4.1	\$1.8	\$2.2	\$3.2	\$2.3	\$4.8	\$5.6	\$7.5	\$9.1	\$8.5	\$11.6	\$12.5	\$13.8
Arkansas Margin Increase	\$18	\$69	\$0.1	\$0.5	\$0.6	\$0.8	\$0.3	\$0.4	\$0.6	\$0.4	\$0.9	\$1.1	\$1.4	\$1.8	\$1.6	\$2.2	\$2.4	\$2.7
La Margin Increase	\$31	\$119	\$0.2	\$0.9	\$1.1	\$1.3	\$0.6	\$0.7	\$1.0	\$0.8	\$1.8	\$1.9	\$2.5	\$3.0	\$2.8	\$3.8	\$4.2	\$4.8
Texas Margin Increase	\$35	\$137	\$0.2	\$1.1	\$1.3	\$1.5	\$0.7	\$0.8	\$1.2	\$0.9	\$1.8	\$2.1	\$2.9	\$3.5	\$3.2	\$4.4	\$4.8	\$5.3
FERC Margin Increase	\$9	\$34	\$0.0	\$0.3	\$0.3	\$0.4	\$0.2	\$0.2	\$0.3	\$0.2	\$0.5	\$0.5	\$0.7	\$0.9	\$0.8	\$1.1	\$1.2	\$1.3
Arkansas Retained Margin Increase	\$2	\$7	\$0.0	\$0.1	\$0.1	\$0.1	\$0.0	\$0.0	\$0.1	\$0.0	\$0.1	\$0.1	\$0.1	\$0.2	\$0.2	\$0.2	\$0.2	\$0.3
La Retained Margin Increase	\$3	\$12	\$0.0	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.2	\$0.2	\$0.2	\$0.3	\$0.3	\$0.4	\$0.4	\$0.5
Texas Retained Margin Increase	\$4	\$14	\$0.0	\$0.1	\$0.1	\$0.2	\$0.1	\$0.1	\$0.1	\$0.1	\$0.2	\$0.2	\$0.3	\$0.3	\$0.3	\$0.4	\$0.5	\$0.5
FERC Retained Margin Increase	\$1	\$3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1
SWEPCO Total Company Retained Margin	\$9	\$36	\$0.0	\$0.3	\$0.3	\$0.4	\$0.2	\$0.2	\$0.3	\$0.2	\$0.5	\$0.6	\$0.8	\$0.9	\$0.8	\$1.2	\$1.3	\$1.4
Congestion																		
Project Low Gas No Carbon			\$2.2	\$13.9	\$14.4	\$14.9	\$15.6	\$16.3	\$17.1	\$17.8	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5
Modeled Congestion/Losses - Zero after be line in service			\$2.2	\$13.9	\$14.4	\$14.9	\$15.6	\$16.3	\$17.1	\$17.8	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5

PSO - SWEPCO North Central Wind Energy Facilities  
Inputs - TIEC 2-2 P95 Low NoCO2

SOAH Docket No 473-19-6862  
PUC Docket No 49737  
TIEC's 2nd, Q # TIEC 2-2S  
Attachment 1  
Page 3 of 3

Year	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051
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**Allocation of Capacity to Jurisdictions.**

Arkansas
Louisiana
Texas
FERC
Total SWEPCO
Oklahoma
Total Project

NPV Discount rate

**Off System Sales Margin Retained by AEP - Deduct fr**

Total Plexos OSS Margin by Case

**Margin Retention**

Arkansas
Louisiana
Texas
FERC

**TIEC 2-2 SWEPCO Low No CO2 P95 Case PLEXOS Inpu**

**Net Production Cost Savings**

Project Low Gas No Carbon	\$497.6	\$511.6	\$536.7	\$536.7	\$560.1	\$590.0	\$596.4	\$618.2	\$636.4	\$653.8	\$611.9	\$627.8	\$701.5	\$729.9	\$789.8
Baseline Low Gas No Carbon=P50 15% case	\$563.7	\$602.9	\$625.0	\$639.0	\$656.4	\$680.1	\$709.8	\$735.8	\$761.6	\$784.0	\$784.2	\$806.1	\$885.4	\$916.7	\$940.3
Savings, pre-margin sharing pre Gen Tie	(\$96.1)	(\$91.3)	(\$88.4)	(\$102.3)	(\$96.3)	(\$100.2)	(\$113.3)	(\$117.6)	(\$125.2)	(\$130.3)	(\$172.2)	(\$178.3)	(\$183.9)	(\$186.9)	(\$170.6)
Less: Lost energy value from losses on Gen Tie	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lost GWh on Gen Tie	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual Average market Price-Load Hub (\$ MWh)	49.2	50.5	51.8	53.6	55.6	57.0	57.9	59.7	62.4	64.5	65.7	67.6	68.3	69.0	69.6
Lost Energy Revenue (\$MM)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Savings, pre-margin sharing	(\$96.1)	(\$91.3)	(\$88.4)	(\$102.3)	(\$96.3)	(\$100.2)	(\$113.3)	(\$117.6)	(\$125.2)	(\$130.3)	(\$172.2)	(\$178.3)	(\$183.9)	(\$186.9)	(\$170.6)

**OSS Margin Savings**

**P95 Low Gas No Carbon Fundamentals (\$ Millions)**

	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051
SWEPCO Gross OSS Margin With Project	\$36.79	\$40.23	\$43.78	\$73.29	\$72.79	\$69.18	\$94.91	\$97.14	\$115.30	\$147.26	\$152.20	\$155.92	\$130.47	\$107.62	\$97.57
SWEPCO Gross OSS Margin Without Project	\$22.40	\$38.90	\$45.92	\$50.02	\$73.07	\$70.89	\$65.64	\$66.75	\$78.68	\$105.57	\$133.87	\$136.15	\$108.01	\$87.91	\$84.51
SWEPCO Gross OSS Margin Increase	\$14.4	\$0.3	(\$2.1)	\$23.3	(\$0.3)	(\$1.7)	\$29.3	\$30.4	\$36.6	\$41.7	\$18.3	\$19.8	\$22.5	\$19.7	\$13.1
Arkansas Margin Increase	\$2.8	\$0.1	(\$0.4)	\$4.5	(\$0.1)	(\$0.3)	\$5.6	\$5.8	\$7.0	\$8.0	\$3.5	\$3.8	\$4.3	\$3.8	\$2.5
La Margin Increase	\$4.8	\$0.1	(\$0.7)	\$7.7	(\$0.1)	(\$0.6)	\$9.7	\$10.1	\$12.1	\$13.8	\$6.1	\$6.6	\$7.4	\$6.5	\$4.3
Texas Margin Increase	\$5.5	\$0.1	(\$0.8)	\$8.9	(\$0.1)	(\$0.7)	\$11.2	\$11.6	\$14.0	\$15.9	\$7.0	\$7.5	\$8.6	\$7.5	\$5.0
FERC Margin Increase	\$1.4	\$0.0	(\$0.2)	\$2.2	(\$0.0)	(\$0.2)	\$2.8	\$2.9	\$3.5	\$4.0	\$1.8	\$1.9	\$2.2	\$1.9	\$1.3
Arkansas Retained Margin Increase	\$0.3	\$0.0	(\$0.0)	\$0.4	(\$0.0)	(\$0.0)	\$0.6	\$0.6	\$0.7	\$0.8	\$0.4	\$0.4	\$0.4	\$0.4	\$0.3
La Retained Margin Increase	\$0.5	\$0.0	(\$0.1)	\$0.8	(\$0.0)	(\$0.1)	\$1.0	\$1.0	\$1.2	\$1.4	\$0.6	\$0.7	\$0.7	\$0.7	\$0.4
Texas Retained Margin Increase	\$0.5	\$0.0	(\$0.1)	\$0.9	(\$0.0)	(\$0.1)	\$1.1	\$1.2	\$1.4	\$1.6	\$0.7	\$0.8	\$0.9	\$0.8	\$0.5
FERC Retained Margin Increase	\$0.1	\$0.0	(\$0.0)	\$0.2	(\$0.0)	(\$0.0)	\$0.3	\$0.3	\$0.4	\$0.4	\$0.2	\$0.2	\$0.2	\$0.2	\$0.1
SWEPCO Total Company Retained Margin	\$1.4	\$0.0	(\$0.2)	\$2.3	(\$0.0)	(\$0.2)	\$2.9	\$3.0	\$3.7	\$4.2	\$1.8	\$2.0	\$2.2	\$2.0	\$1.3

**Congestion**

Project Low Gas No Carbon	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$15.6
Modeled Congestion/Losses - Zero after be line in service	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$18.5	\$15.6

**SOAH DOCKET NO. 473-19-6862  
PUC DOCKET NO. 49737**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S SUPPLEMENTAL RESPONSE  
TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR  
INFORMATION REQUEST FOR INFORMATION**

**Question No. TIEC 2-7:**

Please provide the NPV benefit analysis for the case where only 810 MW of the Traverse facility is approved.

**Response No. TIEC 2-7:**

As stated in the Company's response to TIEC 1-19, the Company is reviewing a portion of its analysis which may lead to updated/supplemental workpapers for Company witness Torpey's economic benefit analysis. Once this review is complete the response to this request will be supplemented with the requested information.

**Supplemental Response No. TIEC 2-7:**

See TIEC\_2\_7\_Supplemental\_Attachment\_1 for the requested analysis, which was prepared pursuant to this request. Inputs are based on the Base Fundamentals with and without CO2 cases included with the Company's August 23, 2019 Errata filing. Note that this scenario can only occur if PSO does not receive approval for its share of the Selected Wind Facilities.

Prepared By: Jon R. Maclean

Title: Resource Planning Mgr

Prepared By: James F. Martin

Title: Regulatory Case Mgr

Sponsored By: Jay F. Godfrey

Title: VP Energy Mktng & Renewables

Sponsored By: John F. Torpey

Title: Mng Dir Res Plnning&Op Anlysis

**NORTH CENTRAL WIND ENERGY FACILITIES - SWEP CO 810 MW TRAVERSE ONLY**  
**P50 15% CAPACITY CREDIT BASE GAS WITH CARBON CUSTOMER COSTS AND BENEFITS VS MARKET - No Tie Line**  
 \$ in Millions (Nominal unless otherwise indicated)

SOAH Docket No. 473-19-6862  
 PUC Docket No. 49737  
 TIEC's 2nd, Q. # TIEC 2-7S  
 Attachment 1  
 Page 1 of 2

Year	NPV	Total 31 Yr. Nominal	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1 Production Cost Savings Excluding Congestion/Losses	\$1,744	\$5,043	\$0	\$85	\$88	\$92	\$96	\$100	\$103	\$141	\$141	\$145	\$149
2 Congestion and Losses	(\$341)	(\$895)	\$0	(\$18)	(\$19)	(\$20)	(\$22)	(\$25)	(\$27)	(\$29)	(\$32)	(\$32)	(\$32)
3 Capacity Value	\$75	\$311	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4 Production Tax Credits, Grossed Up	\$637	\$920	\$0	\$84	\$87	\$87	\$90	\$90	\$94	\$94	\$97	\$97	\$100
5 Deferred Tax Asset Carrying Charges	(\$51)	(\$72)	\$0	(\$3)	(\$7)	(\$9)	(\$10)	(\$11)	(\$10)	(\$9)	(\$8)	(\$4)	(\$0)
6 Wind Facility Revenue Requirement	(\$1,369)	(\$3,095)	\$0	(\$126)	(\$124)	(\$125)	(\$122)	(\$121)	(\$121)	(\$119)	(\$118)	(\$116)	(\$114)
7 Tie Line Revenue Requirement	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>8. Total Net Customer Benefits/(Cost)</b>	<b>\$695</b>	<b>\$2,212</b>	<b>\$0</b>	<b>\$22</b>	<b>\$25</b>	<b>\$26</b>	<b>\$32</b>	<b>\$33</b>	<b>\$39</b>	<b>\$77</b>	<b>\$80</b>	<b>\$90</b>	<b>\$102</b>

Year	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
1 Production Cost Savings Excluding Congestion/Losses	\$153	\$157	\$162	\$168	\$170	\$175	\$168	\$172	\$187	\$184	\$190	\$201	\$209
2 Congestion and Losses	(\$32)	(\$32)	(\$32)	(\$32)	(\$32)	(\$32)	(\$32)	(\$32)	(\$32)	(\$32)	(\$32)	(\$32)	(\$32)
3 Capacity Value	\$0	\$0	\$0	\$0	\$0	\$1	\$54	\$55	(\$1)	\$56	\$55	(\$3)	(\$1)
4 Production Tax Credits, Grossed Up	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5 Deferred Tax Asset Carrying Charges	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6 Wind Facility Revenue Requirement	(\$112)	(\$109)	(\$107)	(\$105)	(\$103)	(\$101)	(\$99)	(\$98)	(\$96)	(\$94)	(\$93)	(\$91)	(\$89)
7 Tie Line Revenue Requirement	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>8. Total Net Customer Benefits/(Cost)</b>	<b>\$10</b>	<b>\$16</b>	<b>\$23</b>	<b>\$31</b>	<b>\$35</b>	<b>\$42</b>	<b>\$91</b>	<b>\$98</b>	<b>\$58</b>	<b>\$113</b>	<b>\$120</b>	<b>\$76</b>	<b>\$87</b>

Year	2046	2048	2047	2048	2049	2050	2051
1 Production Cost Savings Excluding Congestion/Losses	\$217	\$222	\$223	\$236	\$238	\$238	\$241
2 Congestion and Losses	(\$32)	(\$32)	(\$32)	(\$32)	(\$32)	(\$32)	(\$32)
3 Capacity Value	(\$0)	(\$1)	\$50	\$46	(\$3)	(\$2)	\$4
4 Production Tax Credits, Grossed Up	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5 Deferred Tax Asset Carrying Charges	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6 Wind Facility Revenue Requirement	(\$87)	(\$86)	(\$84)	(\$83)	(\$82)	(\$83)	(\$86)
7 Tie Line Revenue Requirement	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>8. Total Net Customer Benefits/(Cost)</b>	<b>\$98</b>	<b>\$104</b>	<b>\$157</b>	<b>\$161</b>	<b>\$119</b>	<b>\$122</b>	<b>\$128</b>

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 Page 2 of 2

Year	NPV	Total 31 Yr. Nominal	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1 Production Cost Savings Excluding Congestion/Losses	\$1,521	\$4,341	\$0	\$84	\$88	\$91	\$95	\$99	\$102	\$106	\$109	\$114	\$118
2 Congestion and Losses	(\$285)	(\$725)	\$0	(\$18)	(\$19)	(\$19)	(\$21)	(\$22)	(\$23)	(\$24)	(\$25)	(\$25)	(\$25)
3 Capacity Value	\$62	\$274	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4 Production Tax Credits, Grossed Up	\$637	\$920	\$0	\$84	\$87	\$87	\$90	\$90	\$94	\$94	\$97	\$97	\$100
5 Deferred Tax Asset Carrying Charges	(\$51)	(\$72)	\$0	(\$3)	(\$7)	(\$9)	(\$10)	(\$11)	(\$10)	(\$9)	(\$8)	(\$4)	(\$0)
6 Wind Facility Revenue Requirement	(\$1,369)	(\$3,095)	\$0	(\$126)	(\$124)	(\$125)	(\$122)	(\$121)	(\$121)	(\$119)	(\$118)	(\$116)	(\$114)
7 Tie Line Revenue Requirement	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8. Total Net Customer Benefits/(Cost)	\$514	\$1,643	\$0	\$22	\$25	\$25	\$32	\$35	\$42	\$47	\$55	\$65	\$78

Year	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
1 Production Cost Savings Excluding Congestion/Losses	\$123	\$127	\$137	\$143	\$145	\$150	\$146	\$144	\$158	\$154	\$160	\$172	\$178
2 Congestion and Losses	(\$25)	(\$25)	(\$25)	(\$25)	(\$25)	(\$25)	(\$25)	(\$25)	(\$25)	(\$25)	(\$25)	(\$25)	(\$25)
3 Capacity Value	\$0	\$0	(\$7)	(\$7)	(\$8)	(\$6)	\$47	\$55	(\$0)	\$55	\$52	(\$1)	\$2
4 Production Tax Credits, Grossed Up	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5 Deferred Tax Asset Carrying Charges	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6 Wind Facility Revenue Requirement	(\$112)	(\$109)	(\$107)	(\$105)	(\$103)	(\$101)	(\$99)	(\$98)	(\$96)	(\$94)	(\$93)	(\$91)	(\$89)
7 Tie Line Revenue Requirement	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8. Total Net Customer Benefits/(Cost)	(\$14)	(\$7)	(\$3)	\$5	\$9	\$18	\$68	\$76	\$37	\$89	\$94	\$55	\$66

Year	2045	2046	2047	2048	2049	2050	2051
1 Production Cost Savings Excluding Congestion/Losses	\$188	\$194	\$190	\$194	\$207	\$209	\$212
2 Congestion and Losses	(\$25)	(\$25)	(\$25)	(\$25)	(\$25)	(\$25)	(\$25)
3 Capacity Value	\$3	\$1	\$47	\$44	(\$3)	(\$2)	\$4
4 Production Tax Credits, Grossed Up	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5 Deferred Tax Asset Carrying Charges	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6 Wind Facility Revenue Requirement	(\$87)	(\$86)	(\$84)	(\$83)	(\$82)	(\$83)	(\$86)
7 Tie Line Revenue Requirement	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8. Total Net Customer Benefits/(Cost)	\$79	\$84	\$127	\$131	\$97	\$99	\$106